

for the proof of fire behaviour according to DIN 4102-1

Reference: FLT 3783322 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Sponsor: Antalis GmbH
Europaallee 19
D - 50226 Frechen

Order: 2022-05-10 **Arrived:** 2022-05-10

Description of samples: On both sides with polyurethane coated fabric made of polyester, named "COALA Frontlit Evo (II)".
(for details see page 2)

Delivered: 2022-05-11

Content of request: Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1

Assessment: The examined product meets the requirements of class B1 for "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1. If used in one layer, suspended freely or with distance of >40 mm to the same or other plain materials.
(for details see page 5)

Validity 2027-07-31

Sampling: The sample material was sent to the laboratory by the client.

Remark: If the above-mentioned building material is not used as product according to MBO § 2, there is no need for a general building supervisory test certificate.

This test certificate is not regarded as the sole proof if the tested building material is used as building product within the meaning of state building prescriptions (MBO § 17).

This test certificate does not replace an eventually necessary proof of applicability concerning building supervisory or building laws in the meaning of state building prescriptions.

This has to be verified by:

- "allgemeine bauaufsichtliche Zulassung" (general building inspectorate approval) or by
- "allgemeines bauaufsichtliches Prüfzeugnis" (general building inspectorate certificate) or by
- "Zustimmung im Einzelfall" (exceptional approval).

This test certificate can serve as a basis for building supervisory procedures for:

- regulated building products for the pre scribed proofs of conformity
- non-regulated building products for the needed proofs of applicability.

This test certificate comprises 5 pages and 2 appendices.

Approved testing, inspection and certification body

This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents. Agreement of the test laboratory has to be given in any case if norms in which the tests are based or other technical standards have changed.



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TEST CERTIFICATE



1 Description of test material

1.1 Test material (according to the sponsor)

The provided material is a fabric made of polyester, coated on both sides with flame retardant treated polyurethane. The coated fabric is intended to be used as a printable advertising space or for decorative purposes and was named with the trade name "COALA Frontlit Evo (II)".

1.2 Description of the delivered samples

For the tests the laboratory received a sample roll of a fabric made of synthetic fibres, plastic coated on both sides, of a length of approximately 3 m and 1.01 m in width. The material was marked with the trade name "COALA Frontlit Evo (II)".

Colour: White on both sides.

Characteristic values: see paragraph 4.1; Photos: see enclosure 1

Further details are deposited with the laboratory, a retain sample has been deposited.

2 Preparation of samples

For the small burner (Brennkasten) tests samples for edge flame exposure (dimensions 190 mm x 90 mm) and samples for surface flame exposure (dimensions 230 mm x 90 mm) were cut in warp and in weft orientation of the support fabric.

For the fire shaft (Brandschacht) tests 2 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A have been cut in warp orientation, the samples for the test specimen B have been cut in weft orientation of the support fabric.

Afterwards all samples were kept in a climate chamber acc. DIN 50014-23/50-2 until they reached constant weight.

3 Arrangement of samples

The tests in the fire shaft ("Brandschacht") have been performed acc. DIN 4102-1 and -16 (building materials class B1). The small burner tests ("Brennkasten") have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2) without edge protection.

Arrangement of all samples: single layer, freely suspended

Test period: June 2022.

4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results small burner tests
- section 4.2.2 Test results fire shaft tests

4.1 Material characteristics

Table 1

Specific values		Specifications by manufacturer	Measured values	
			m.v.	s
Thickness	[mm]	./.	0,30	0,005
Mass per unit area	[g/m ²]	360	349	

./. not received/not measured

m.v. mean value

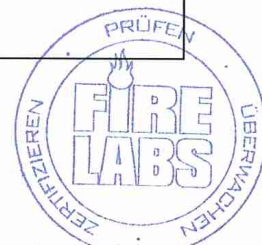
s standard deviation

4.2 Results of the fire behaviour

4.2.1 Test results class B2 (Brennkasten)

According to DIN 4102-1 building materials class B1 must also meet the requirements of class B2 (flammable). The material, tested in "Brennkasten" acc. DIN 50 050 meets the requirements of class B2. The material did not show burning particles/droplets during these tests. Exposing the flame to the front or reverse side did not influence the fire behaviour.

(Results: see enclosure 2)



4.2.2 Test results class B1 (Brandschacht)

Table 3

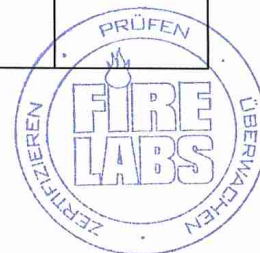
Test results (part 1)						
line no.		Specimen				requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	1	1	-	-	
2	<u>Maximal flame height</u> above bottom edge cm	50	50	-	-	*)
3	Time ¹⁾ min	1	1	-	-	
4	<u>Burning / melting through</u> Time ¹⁾min	1	1	-	-	
5	<u>Back side of the specimens:</u> <u>Flames / glowing</u> Time ¹⁾ min:s	./.	./.	-	-	
6	<u>Discolouring</u> Time ¹⁾ min	./.	./.			
7	<u>Falling of burning droplets</u> Begin ¹⁾ min	No	No	-	-	
8	Extend: Sporadic falling of burning droplets					
9	Continuous falling of burning droplets					
10	<u>Falling of burning parts</u> Begin ¹⁾ min	Yes 1	No	-	-	
11	Extend: Sporadic falling of burning parts	Yes		-	-	
12	Continuous falling of burning parts	No		-	-	
13	<u>Afterflame time at the bottom of the sieve (max.). min:s</u>	0:08	./.	-	-	
14	<u>Impairment of the burner flames by dropping or falling</u> <u>Material</u> Time ¹⁾ min:s	No	No	-	-	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen ¹⁾min	2	2	-	-	
16	Time of eventually end of test ¹⁾ min:s	./.	./.	-	-	

¹⁾ Indication of time: from the beginning of testing procedure

- Not tested

./. Not occurred

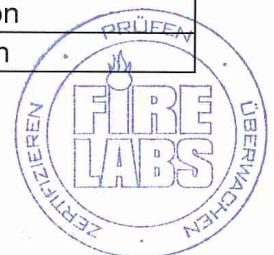
*) No cause for complaint



Test results (part 2)						
line no.		Specimen				requirements
		A	B	C	D	
17	<u>Afterflame after end of test</u>	No	No	-	-	
18	Timemin:s					
19	Number of specimen					
20	Front side of specimen					
21	Back side of specimen					
21	Flame lengthcm					
22	<u>Afterglow after end of test</u>	No	No	-	-	
23	Timemin:s					
24	Number of specimen					
25	Place of appearance:					
26	Lower half of specimen					
27	Upper half of specimen					
28	Front side of specimen					
29	Back side of specimen					
30	<u>Smoke density</u>					
30	≤ 400 % min	53.0	48,0	-	-	
30	≥ 400 % min (very strong smoke density)	./.	./.	-	-	
30	Diagram fig. no.	1	3	-	-	
31	<u>Residual length</u>					
31	Individual valuecm	70 49 61 51	69 61 66 53	- - - -	- - - -	> 0
32	Average valuecm	57	62	-	-	≥ 15
33	Photo of test specimen fig. no.	2	4	-	-	
34	<u>Flue gas temperature</u>					
35	Maximum of average value...°C	119	119	-	-	≤ 200
36	Time ¹⁾min:s	9:54	9:56	-	-	
36	Diagram fig. no.	1	3	-	-	
37	<u>Remarks:</u> line 13: Duration of continued burning of specimen parts at the bottom of the sieve > 20 sec. is considered as burning dripping or falling of burning parts line 32: There were no additional tests proceeded because of the residual length of > 45 cm (DIN 4102-16: 2015-09, 5.2 b)).					

Specimen	Test-no.:	Trade name	Orientation of samples
A	783322-001	COALA Frontlit Evo (II)	warp direction
B	783322-002		weft direction

- 1) indication of time: from the beginning of testing procedure
- not tested
./ not occurred
*) no cause for complaint



5 Assessment

According to the test results in section 4.2 the material, described in section 1 and 4.1, fulfils the requirements of building materials class B1 according to DIN 4102-1 if the material is used suspended freely or with a distance of > 40 mm to the same or other plain materials.

The requirements of building materials class B2 are also fulfilled. No falling of burning parts or droplets occurred during these tests.

The verification

- for outdoor usage (ageing behavior by outdoor weathering)
is not proved with this test certificate.

6 Special remarks

This certificate is only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or surfaces etc. the burning behaviour may differ.

This test certificate is not regarded as the sole proof if the tested building material is used as a building product within the meaning of state building prescriptions (MBO § 17).

This test certificate is no substitute for a General Building Inspectorate Certificate. This test certificate is granted without prejudice to the rights of third parties, or particular private proprietary rights.

In General Building Inspectorates procedures this test certificate can be based for

- regulated building materials for the required proof of accordance
- for not regulated building materials for the required proof of applicability

The explanations given in DIN 4102-1 app. D, especially concerning an external production control has to be considered.

This test certificate is valid until 2027-07-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 2nd August 2022



Head of the test laboratory
Dipl.-Ing. (FH) Uwe Kühnast



This translation was issued 2nd August 2022, in a case of doubt the German version is valid solely.

Test specimen A

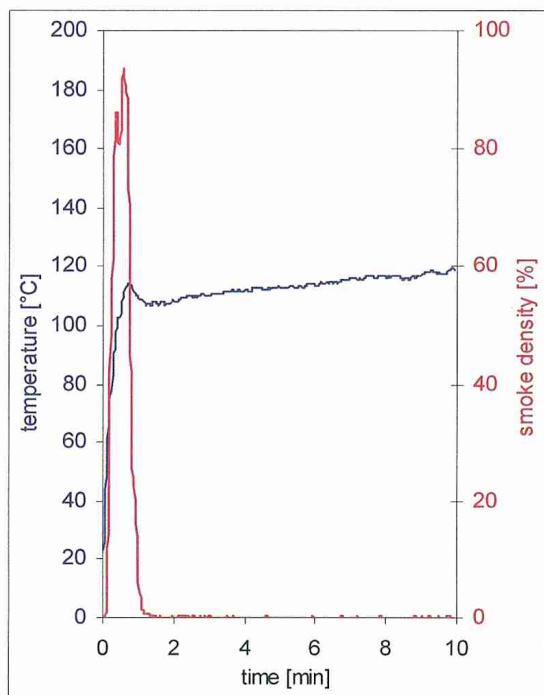


fig. 1
Graphs of the flue gas temperature and the smoke density

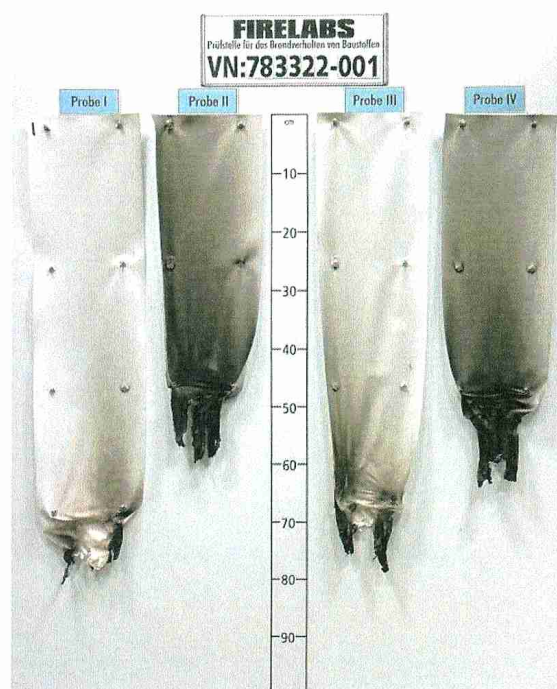


fig. 2
View of test specimen after the test

Test specimen B

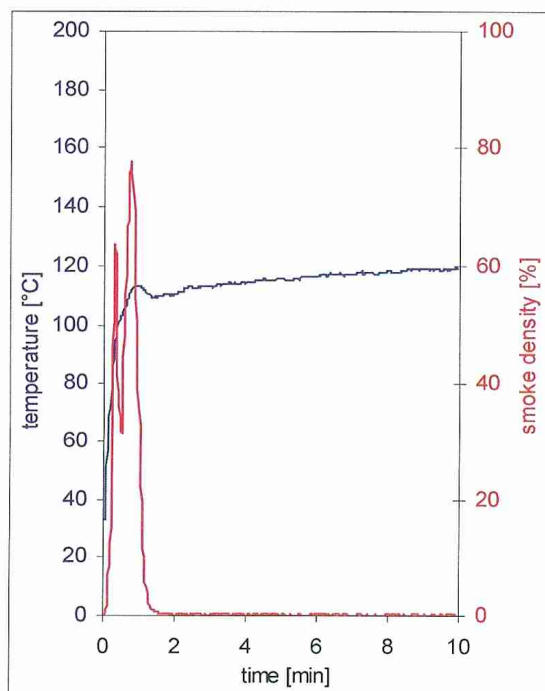


fig. 3
Graphs of the flue gas temperature and the smoke density



fig. 4
View of test specimen after the test
(Sample 4: rear side)

Test results small burner test

Table 2

	warp direction							weft direction							dim.	require- ments
Sample-no.	1	2	3	4	5	6	7	1	2	3	4	5	6	7	-	
Ignition of the sample	1	1	1	1	1	3	3	1	1	1	1	1	3	3	s	-
Maximum flame height	10	12	11	11	10	5	5	13	8	9	8	10	6	5	cm	-
Time of the maximum	13	9	11	12	10	15	15	13	11	11	11	12	9	9	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Self-extinguishing of flames	13	9	11	12	10	16	16	14	11	11	11	13	16	16	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	moderate							moderate							-	-
Afterburning time	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
Flames were extinguished after	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-

View of the samples after the test (20 seconds after exposure the flame):

- warp and weft direction, destroyed or burned length max. 11 cm, destroyed width approx 2 cm, soot above until top edge of samples.

Samples 1-5: Edge flame exposure

Samples 6: Surface flame impingement inside of roll

Samples 7: Surface flame impingement roll outer side

1) No ignition within 20 seconds

./. Not occurred

dim. Dimension

Indication of time: from the beginning of testing procedure

Indication of measurements: from reference line of the flame

